

a converging means having M different effective numerical apertures for converging said light flux on said second layer of ones of said N types of optical discs loaded in said apparatus and performing aberration correction in correspondence with said first layers of said N types of optical discs loaded in said apparatus; and

a photo detecting means for detecting reflected light through said converging means from said ones of said optical discs loaded in said apparatus and for outputting the detected reflected light as an electrical signal,

wherein said converging means converges said light flux as a spot with a smaller diameter D by employing a larger one of said M effective numerical apertures, with respect to one of said optical discs having a thinner one of said first layers,

wherein a thickness of said first layers of each of said N types of optical discs is about 1.2mm or less, and

wherein the thickness of said first layer of the one of the optical discs loaded in said apparatus is discriminated by said electrical signal.

89. An optical recording/reproducing system comprising:

(a) an optical recording/reproducing apparatus for recording, reproducing or erasing an information signal onto/from any one of N types (where $N \geq 2$) of optical discs having first

layers of different thicknesses, each type of said optical discs having at least said first layer being transparent and a second layer for storing information, said apparatus comprising:

a light emitting means for emitting a light flux;

a converging means having M different effective numerical apertures for converging said light flux on said second layer of ones of said N types of optical discs loaded in said apparatus and performing aberration correction in correspondence with said first layers of said N types of optical discs loaded in said apparatus; and

a photo detecting means for detecting reflected light through said converging means from said one of said optical discs loaded in said apparatus and for outputting the detected reflected light as an electrical signal,

wherein said converging means converges said light flux as a spot with a smaller diameter D by employing a larger one of said effective numerical apertures, with respect to one of said optical discs having a thinner one of said first layers,

wherein a thickness of said first layers of each of said N types of optical discs is about 1.2mm or less, and

wherein the thickness of said first layer of the one of the optical discs loaded in said apparatus is discriminated by said electrical signal;

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(b) a signal processing means, responsive to one of (i) a reproduction signal, corresponding to said information signal, from said photo detecting means and (ii) receipt of recording data, corresponding to said information signal, for recording on said disk, for generating an output signal corresponding to said information signal for performing one of a reproducing operation and a recording operation on said discs; and

(c) a system controlling means coupled to said signal processing means for controlling generation of the output signal of said signal processing means.

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90. An apparatus according to claim 87, wherein M is less than N.

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91. An apparatus according to claim 87, wherein M equals N.

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92. An apparatus according to claim 87, wherein each of said first layers comprises a transparent substrate.

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93. A system according to claim 89, wherein M is less than N.

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94. A system according to claim 89, wherein M equals N.

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95. A system according to claim 89, wherein each of said first layers comprises a transparent substrate.

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96. An optical recording/reproducing apparatus for recording, reproducing or erasing an information signal onto/from any one of N types (where $N \geq 2$) of optical discs having first

layers of different thicknesses, each type of said optical discs having at least said first layer being transparent and a second layer for storing information, said apparatus comprising:

a light emitting means for emitting a light flux;

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a converging optical system including a first converging means comprising a first numerical aperture and a second converging means comprising a second numerical aperture, said optical system for converging, by employing one of said first converging means and said second converging means, a light flux on said second layer of one or more of said N types of optical discs, said first numerical aperture and said second numerical aperture being different from one another,

a photo detecting means for detecting reflected light through said converging means from said one of said optical discs loaded in said apparatus through said converging means and for outputting the detected reflected light as an electrical signal,

wherein said converging means converges said light flux as a spot with a smaller diameter D by employing one of said first and second converging means having a larger one of said effective numerical apertures, with respect to one of said optical discs having a thinner one of said first layers,

wherein a thickness of said first layers of each of said N types of optical discs is about 1.2mm or less, and

wherein the thickness of said first layer of the one of the optical discs loaded in said apparatus is discriminated by said electrical signal.

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97. An apparatus as in claim 96, wherein each of said first layers comprises a transparent substrate.

98. An optical recording/reproducing system comprising:

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(a) an apparatus for recording, reproducing or erasing an information signal onto/from any one of N types (where $N \geq 2$) of optical discs having first layers of different thicknesses, each type of said optical discs having at least said first layer being transparent and a second layer for storing information, said apparatus comprising:

a light emitting means for emitting a light flux;

a converging optical system including a first converging means comprising a first numerical aperture and a second converging means comprising a second numerical aperture, said optical system for converging, by employing one of said first converging means and said second converging means, a light flux on said second layer of one or more of said N types of optical discs, said first numerical aperture and said second numerical aperture being different from one another,

a photo detecting means for detecting reflected light through said converging means from said one of said optical discs

loaded in said apparatus through said converging means and for outputting the detected reflected light as an electrical signal,

wherein said converging means converges said light flux as a spot with a smaller diameter D by employing one of said first and second converging means having a larger one of said effective numerical apertures, with respect to one of said optical discs having a thinner one of said first layers,

wherein a thickness of said first layers of each of said N types of optical discs is about 1.2mm or less, and

wherein the thickness of said first layer of the one of the optical discs loaded in said apparatus is discriminated by said electrical signal;

(b) a signal processing means, responsive to one of (i) a reproduction signal, corresponding to said information signal, from said photo detecting means and (ii) receipt of recording data, corresponding to said information signal, for recording on said disk, for generating an output signal corresponding to said information signal for performing one of a reproducing operation and a recording operation on said discs; and

(c) a system controlling means coupled to said signal processing means for controlling generation of the output signal of said signal processing means.

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99. A system as in claim 98, wherein each of said first layers comprises a transparent substrate.

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100. A system comprising:

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(a) an optical recording/reproducing apparatus for recording, reproducing or erasing an information signal onto/from any one of N types (where $N \geq 2$) of optical discs having first layers of different thicknesses, each type of said optical discs having at least said first layer being transparent and a second layer for storing information, said apparatus comprising:

a light emitting means for emitting a light flux;

a converging means having M different effective numerical apertures for converging said light flux on said second layer of ones of said N types of optical discs loaded in said apparatus and performing aberration correction in correspondence with said first layers of said N types of optical discs loaded in said apparatus; and

a photo detecting means for detecting reflected light through said converging means from said one of said optical discs loaded in said apparatus and for outputting the detected reflected light as an electrical signal,

wherein said converging means converges said light flux as a spot with a smaller diameter D by employing a larger one of said

effective numerical apertures, with respect to one of said optical discs having a thinner one of said first layers,

wherein a thickness of said first layers of each of said N types of optical discs is about 1.2mm or less, and

wherein the thickness of said first layer of the one of the optical discs loaded in said apparatus is discriminated by said electrical signal;

(b) a signal processing apparatus including:

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signal processing means, responsive to one of (i) a reproduction signal, corresponding to said information signal, from said photo detecting means and (ii) receipt of recording data, corresponding to said information signal, for recording on said disk, for generating an output signal corresponding to said information signal for performing one of a reproducing operation and a recording operation on said discs; and

system controlling means coupled to said signal processing means for controlling generation of the output signal of said signal processing means.

Please add the following new claims:

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101. An apparatus according to claim 87, further comprising
a disc discrimination means for discriminating the thickness of the first layer of the disc and for generating a discrimination signal in accordance with a result of the discrimination; and

a controlling means for causing the converging means to converge the light flux as a spot with a particular diameter to minimize aberration due to the first layer in accordance with said disc discrimination signal.

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102. A system according to claim 89, wherein said optical recording/reproducing apparatus further comprises a disc discrimination means for discriminating the thickness of the first layer of the disc and for generating a discrimination signal in accordance with a result of the discrimination; and a controlling means for causing the converging means to converge the light flux as a spot with a particular diameter to minimize aberration due to the first layer in accordance with said disc discrimination signal.

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103. An apparatus according to claim 96, further comprising a disc discrimination means for discriminating the thickness of the first layer of the disc and for generating a discrimination signal in accordance with a result of the discrimination; and a controlling means for causing the converging means to converge the light flux as a spot with a particular diameter to minimize aberration due to the first layer in accordance with said disc discrimination signal.

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104. A system according to claim 98, wherein said apparatus for recording, reproducing or erasing further comprises a disc

discrimination means for discriminating the thickness of the
first layer of the disc and for generating a discrimination
signal in accordance with a result of the discrimination; and
a controlling means for causing the converging means to converge
the light flux as a spot with a particular diameter to minimize
aberration due to the first layer in accordance with said disc
discrimination signal.

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105. A system according to claim 100, wherein said optical
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recording/reproducing apparatus further comprises a disc
discrimination means for discriminating the thickness of the
first layer of the disc and for generating a discrimination
signal in accordance with a result of the discrimination; and a
controlling means for causing the converging means to converge
the light flux as a spot with a particular diameter to minimize
aberration due to the first layer in accordance with said disc
discrimination signal.